CLAIMS

1. A method of dispersion compensation comprising the steps of:

receiving an optical signal having a number of channels separated by wavelength; and, applying dispersion compensation over at least one predetermined wavelength band independently of wavelengths outside the wavelength band, wherein the wavelength band spans a plurality of channels numbering less than the total number of channels in the signal.

2. A method according to claim 1, further comprising the steps of:

splitting the plurality of channels into two or more wavelength bands;

propagating the two or more wavelength bands along separate optical paths, wherein dispersion compensation is applied in at least one of the optical paths; and, subsequently re-combining the signals at an optical output.

3. A method according to claim 2, in which the signal carried by at least one of the optical paths is amplified to compensate for losses.

4. A method according to any preceding claim, in which dispersion compensation is provided by means of a number of lengths of dispersion compensating optical fibre.

5. A method according to claim 1, including the step of:

passing the entire optical signal through a band-selective dispersion compensation element adapted to

apply dispersion compensation only to channels within a predetermined wavelength band.

6. A method according to claim 5, in which channels outside the predetermined wavelength band are reflected by a separate optical element.

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7. A method according to claim 5 or 6, in which the dispersion compensating element is a photorefractive element or a diffraction grating.

8. A method according to any preceding claim, further comprising the step of:

imposing a uniform delay to a particular wavelength band to compensate for relative dispersion between the particular wavelength band and a second different wavelength band.

9. A dispersion compensation device for applying dispersion compensation to an optical signal having a number of channels, comprising a dispersion compensation element which is configured to apply dispersion compensation only to a predetermined wavelength band independently of wavelengths outside the wavelength band, the predetermined wavelength band spanning a plurality of channels numbering less than the total number of channels of the optical signal.

10. A device according to claim 9, further comprising a band splitter arranged to feed two or more optical paths, wherein at least one of the optical paths comprises a dispersion compensation element.

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11. A device according to claims 9 or 10, in which the dispersion compensation element comprises a length of

dispersion compensating optical fibre.

12. A device according to any of claims 9 to 11, further comprising an optical coupler arranged to feed an optical signal received at an optical input to an optical path having a dispersion compensation element, the dispersion compensation element being adapted to apply dispersion compensation to a number of channels within a limited bandwidth and reflect signals within that bandwidth to an optical output of the optical coupler.

13. A device according to claim 12, in which the optical coupler is an optical circulator .

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14. A device according to any of claims 9 to 13, in which the dispersion compensation element is a diffraction grating.

15. A device according to any one of claims 9 to 13, in which the dispersion compensation element is a photorefractive element.

16. A device according to any of claims 9 to 15, in which the dispersion compensation device further comprises an optical reflector coupled to the dispersion compensating element to reflect optical signals outside of the predetermined bandwidth to the optical output of the optical coupler .

17. A device according to any of claims 9 to 16, further comprising a delay element to provide inter-band dispersion compensation.

18. A device according to claim 17, in which the delay element is a length of optical fibre coupled between the

dispersion compensation element and the optical reflector.

19. A dispersion compensation device according to any of claims 9 to 18 comprising a housing having at least one spool of dispersion compensation fibre arranged axially within the housing so as to provide a passage extending along a length of the housing through the core of the spool.

20. A device according to claim 19, in which the housing is a submarine housing.

21. A device according to claim 20, in which the submarine housing is a casing for an optical repeater.

22. A method of dispersion compensation substantially as described herein with or without reference to any of Figures 1 to 8 of the accompanying drawings.

23. A dispersion compensation device substantially as shown in and/or described herein with or without reference to any of Figures 1 to 8 of the accompanying drawings.